Claims

1. A process for producing an agglomerated superabsorbent polymer particle, comprising as steps:

(A) bringing superabsorbent polymer fine particles which have to at least 40 wt. % a particle size of less than 150 µm, into contact with a fluid comprising to more than 10 wt. %, based on the total weight of the fluid, a cross-linkable, uncrosslinked polymer, which polymer is based on polymerised, ethylenically unsaturated, acid groups-bearing monomers or salts thereof to at least 20 wt. %, based on the total weight of the cross-linkable, uncrosslinked polymer,

(B) cross-linking the uncrosslinked polymer by heating the superabsorbent polymer fine particles brought into contact with the fluid to a temperature within a range from 20 to 300 °C, so that the cross-linkable, uncrosslinked polymer is at least partially crosslinked,

wherein

(a) the cross-linkable, uncrosslinked polymer comprises, besides the polymerised, ethylenically unsaturated, acid groups-bearing monomers, further polymerised, ethylenically unsaturated monomers (M) which can react with polymerised acid group-bearing monomers in a condensation reaction, in an addition reaction or in a ring opening reaction, and/or

(b) the fluid comprises, beside the cross-linkable, uncrosslinked polymer, a crosslinker.

2. Process according to claim 1, wherein the cross-linkable, uncrosslinked polymer has a weight average molecular weight of more than 8000 g/mol.

3. Process according to claim 1 or 2, wherein the monomer (M) is a polymerised, ethylenically unsaturated conversion product of saturated aliphatic, cycloaliphatic, aromatic alcohols, amines or thiols with ethylenically unsaturated carboxylic acid, carboxylic acid derivatives or allyl halides.

4. Process according to any one of the preceding claims, wherein the superabsorbent polymer fine particles comprise an inner portion and a surface portion bordering the inner portion and wherein the surface portion comprises a different chemical composition that the inner portion or differs from the inner portion in a physical property.

5. Process according to any one of the preceding claims, wherein the bringing into contact of the superabsorbent polymer fine particles with the fluid occurs in the presence of an effect material based on a polysaccharide or on a silicon-oxygen-comprising compound or on a mixture of at least two thereof.

6. Process according to claim 5, wherein the effect material is a zeolite.

7. Process according to any one of the preceding claims, wherein the bringing into contact occurs in a fluidized bed.

8. Process according to any one of the preceding claims, wherein during or after step (B) a postcrosslinker is added as step (C).

9. Superabsorbent polymer particle obtainable by a process according to any one of the preceding claims.

10. Superabsorbent polymer particle comprising to more than 75 wt. % superabsorbent polymer particles, wherein:

(A1) the superabsorbent polymer fine particles have, to at least 40 wt. % based on the total weight of the superabsorbent polymer fine particles, a particle size of less than 150 µm and abut at least partially onto a matrix of a crosslinked polymer,

(A2) wherein the crosslinked polymer is based to at least 20 wt. %, based on the total weight of the crosslinked polymer, on polymerised acid group-bearing monomers or salts thereof,

(A3) the crosslinked polymer comprises a different chemical composition to the superabsorbent polymer fine particles or differs from the superabsorbent polymer fine particles in a physical property, and

(A4) wherein the superabsorbent polymer particle comprises a portion of particles with a particle size of less than 150 µm of less than 50 wt. % after carrying out once the stability test described herein.

11. Superabsorbent polymer particle comprising superabsorbent polymer fine particles which have, to at least 50 wt. % based on the total weight of the superabsorbent polymer fine particles, an average particle size of less than 150 µm and which abut onto a matrix of a crosslinked polymer, wherein:

(B1) the crosslinked polymer is based to at least 20 wt. %, based on the total weight of the crosslinked polymer, on ethylenic acid group-bearing monomers or salts thereof,

(B2) the crosslinked polymer comprises a different chemical composition to the superabsorbent polymer fine particles or differs from the superabsorbent polymer fine particles in a physical property, and wherein

(B3) the matrix comprises, besides the crosslinked polymer, an effect material based on a polysaccharide or on a polyalkylether polyol or on

a silicon-oxygen-comprising compound or on a mixture of at least two thereof.

12. Superabsorbent polymer particle according to any one of claims 9 to 11, wherein the superabsorbent polymer fine particles comprise an inner portion and a surface portion bordering the inner portion and wherein the surface portion comprises a different chemical composition to the inner portion or differs from the inner portion in a physical property.

13. Superabsorbent polymer particle according to any one of claims 9 to 12, wherein the superabsorbent polymer particles comprise an inner portion and a surface portion bordering the inner portion and wherein the surface portion comprises a different chemical composition to the inner portion or differs from the inner portion in a physical property.

14. Superabsorbent polymer particles according to any one of claims 9 to 13, wherein the superabsorbent polymer particles have at least one of the following properties:

a1) a particle size distribution, whereby at least 80 wt. % of the particles have a particle size within a range of 20 μm to 5 mm;

a2) a Centrifuge Retention Capacity (CRC) of at least 5 g/g;

a3) an Absorption Against Pressure (AAP) at 0.7 psi of at least 5 g/g;

a4) a water-soluble polymer content of less than 25 wt. % after 16 hours extraction.

15. A composite comprising the superabsorbent polymer particles according to any one of claims 9 to 14 and a substrate.

16. A process for producing a composite, wherein the superabsorbent polymer particles according to any one of claims 7 to 12 and a substrate and optionally an additive are brought into contact with each other.

17. A composite obtainable according to the process according to claim 14.

18. Use of the superabsorbent polymer particles according to any one of claims 7 to 12 or of the composite according to claim 13 or 15 in hygiene products, for combating floods, for insulation against water, for regulating the water management of soils or for treating food products.